

RECEIVED  
FEB 23 1996  
OSTI

# **FINAL AUDIT REPORT OF REMEDIAL ACTION CONSTRUCTION AT THE UMTRA PROJECT SITE GUNNISON, COLORADO**

**January 1996**

## **DISCLAIMER**

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

**MASTER**

**INTENDED FOR PUBLIC RELEASE**

**This report has been reproduced from the best available copy. Available in paper copy and microfiche**

**Number of pages in this report: 44**

**DOE and DOE contractors can obtain copies of this report from:**

**Office of Scientific and Technical Information  
P.O. Box 62  
Oak Ridge, TN 37831  
(615) 576-8401**

**This report is publicly available from:**

**National Technical Information Service  
Department of Commerce  
5285 Port Royal Road  
Springfield, VA 22161  
(703) 487-4650**

**FINAL AUDIT REPORT OF REMEDIAL ACTION CONSTRUCTION  
AT THE UMTRA PROJECT SITE  
GUNNISON, COLORADO**

**January 1996**

**Prepared for  
U.S. Department of Energy  
Environmental Restoration Division  
UMTRA Project Team  
Albuquerque, New Mexico**

**Prepared by  
Jacobs Engineering Group Inc.  
Albuquerque, New Mexico**



## EXECUTIVE SUMMARY

The final audit report for remedial action at the Gunnison, Colorado Uranium Mill Tailings Remedial Action (UMTRA) Project site consists of a summary of the radiological surveillances/audits, quality assurance (QA) in-process surveillances, and QA remedial action close-out inspections performed by the U.S. Department of Energy (DOE) and the Technical Assistance Contractor (TAC); and on-site construction reviews (OSCR) performed by the U.S. Nuclear Regulatory Commission (NRC).

Two radiological surveillances and four radiological audits were performed at the Gunnison site. The surveillances were performed on 16 to 19 September 1992 (DOE, 1992a) and 28 June to 1 July 1993 (DOE, 1993a). The radiological audits were performed on 4 to 7 October 1993 (DOE, 1993b); 13 to 16 June 1994 (DOE, 1994a); 19 to 22 September 1994 (DOE, 1994b) and 10 to 12 July 1995 (DOE, 1995a). The surveillances and audits resulted in 79 observations. Thirty-four of the observations raised DOE concerns that were resolved on the site or through subsequent corrective action. All outstanding issues were closed on 12 July 1995. The radiological surveillances and audits are discussed in Section 2.0 of this report.

Ten QA in-process surveillances were performed at the Gunnison UMTRA Project site. The surveillances were performed on 24 to 25 September 1992 (DOE, 1992b), 7 to 9 July 1993 (DOE, 1993c), 29 October 1993 (DOE, 1993d), 27 to 28 June 1994 (DOE, 1994c), 31 October to 1 November 1994 (DOE, 1994d), 19 to 20 June 1995 (DOE, 1995b), 20 to 21 July 1995 (DOE, 1995c), 17 to 18 August 1995 (DOE, 1995d), 20 September 1995 (DOE, 1995e), and 11 to 13 October 1995 (DOE, 1995f). The surveillances resulted in 100 observations. Six observations contained recommendations that required responses from the Remedial Action Contractor (RAC). Ninety-five observations contained a recommendation that required no response. All outstanding issues were closed on 8 January 1996 (Scoutaris, 1996). The QA in-process surveillances are discussed in Section 3.0 of this report.

The DOE/TAC Gunnison remedial action close-out inspection performed on 4 to 5 December 1995 (DOE, 1995g) resulted in 20 open items (see Section 4.0 for discussion). On 9 January 1996, M. Scoutaris, DOE Environmental Restoration Division (ERD) QA manager for the UMTRA Project, administratively closed the remedial action close-out inspection for the Gunnison UMTRA Project. Documentation of completion for each of the 20 open items will need to be sent to M. Scoutaris. Verification of completion, to the DOE's satisfaction, for open items will be determined by S. Arp or M. Scoutaris of the DOE ERD. Therefore, this final audit report segment of the site certification process is complete.

Audits such as NRC OSCRs were performed at the Gunnison site. An NRC OSCR was performed at the Gunnison sites on 1 September 1993 (NRC, 1993). The OSCR resulted in four observations. All issues for NRC OSCRs were closed on 17 November 1993.

To summarize, a total of 199 observations were noted during DOE/TAC audit and surveillance activities. A total of four observations were made at the NRC OSCR.

Follow-up to responses required from the RAC for the DOE/TAC surveillance and audit observations and NRC OSCR indicated all issues related to the Gunnison site were resolved and closed to the satisfaction of the DOE ERD.

## TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION.....	1-1
1.1 Radiological surveillances/audits .....	1-1
1.2 Quality assurance in-process surveillances .....	1-1
1.3 Remedial action close-out inspection .....	1-1
1.4 Other quality assurance audits/surveillances.....	1-3
1.5 Audit procedures.....	1-3
1.6 General standards .....	1-3
2.0 RADIOLOGICAL SURVEILLANCES/AUDITS .....	2-1
2.1 Surveillance/audit objectives .....	2-1
2.2 Surveillance/audit results .....	2-2
2.2.1 Radiological surveillance GUN-S01.....	2-2
2.2.2 Radiological surveillance GUN-S02.....	2-3
2.2.3 Radiological audit GUN-A03.....	2-5
2.2.4 Radiological audit GUN-A04.....	2-7
2.2.5 Radiological audit GUN-A05.....	2-8
2.2.6 Radiological audit GUN-A06.....	2-9
2.3 Summary and conclusions.....	2-10
3.0 QUALITY ASSURANCE IN-PROCESS SURVEILLANCES .....	3-1
3.1 Surveillance objectives .....	3-1
3.2 Surveillance results .....	3-1
3.2.1 Surveillance S211.....	3-1
3.2.2 Surveillance QS93036 .....	3-2
3.2.3 Surveillance QS93056 .....	3-2
3.2.4 Surveillance QS94127 .....	3-3
3.2.5 Surveillance QS94139 .....	3-3
3.2.6 Surveillance QS95156 .....	3-3
3.2.7 Surveillance QS95167 .....	3-4
3.2.8 Surveillance QS95171 .....	3-4
3.2.9 Surveillance QS95173 .....	3-4
3.2.10 Surveillance QS95179 .....	3-4
3.3 Summary and conclusions.....	3-5
4.0 REMEDIAL ACTION CLOSE-OUT INSPECTION.....	4-1
4.1 Remedial action close-out inspection objectives.....	4-1
4.2 Remedial action close-out inspection results.....	4-1
4.2.1 Long-term surveillance plan.....	4-1
4.2.2 Office and staging area .....	4-2
4.2.3 Erosion protection materials .....	4-2
4.2.4 Site restoration.....	4-2
4.2.5 Miscellaneous.....	4-3
4.2.6 Survey for as-built and quantity.....	4-3
4.2.7 Haul road - private property issues.....	4-3

**TABLE OF CONTENTS (Concluded)**

<b><u>Section</u></b>	<b><u>Page</u></b>
4.3 Summary and conclusions for the remedial action close-out inspection .....	4-3
5.0 OTHER AUDITS AND CONSTRUCTION REVIEWS .....	5-1
5.1 On-site construction review objectives .....	5-1
5.2 On-site construction reviews .....	5-1
5.3 NRC on-site construction review results .....	5-1
5.3.1 Observations, 1 September 1993 .....	5-1
5.4 Summary and conclusions.....	5-3
6.0 SUMMARY AND CONCLUSIONS .....	6-1
7.0 LIST OF CONTRIBUTORS.....	7-1
8.0 REFERENCES .....	8-1



## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1.1 Summary of audits and surveillances.....	1-2

## LIST OF ACRONYMS

<u>Acronym</u>	<u>Definition</u>
CDPHE	Colorado Department of Public Health and Environment
DOE	U.S. Department of Energy
DOP	dioctyl phthalate
EPA	U.S. Environmental Protection Agency
ERD	Environmental Restoration Division
HP	health physics
HEPA	high efficiency particulates in air
MK-EGG	Morrison Knudsen-Environmental Government Group
MK-F	Morrison Knudsen-Ferguson
NRC	U.S. Nuclear Regulatory Commission
OCS	Opposed Crystal System
OSCR	on-site construction review
PID	project interface document
QA	quality assurance
QC	quality control
RAC	Remedial Action Contractor
RAIP	remedial action inspection plan
RAP	remedial action plan
RGM	radon gas monitor
SOP	standard operating procedure
TAC	Technical Assistance Contractor
UMTRA	Uranium Mill Tailings Remedial Action
VP	vicinity property

## **1.0 INTRODUCTION**

This final audit report provides an independent assessment by the U.S. Department of Energy (DOE) and Technical Assistance Contractor (TAC) of remedial action compliance with approved plans, specifications, standards, and 40 CFR Part 192. This report refers to remedial action activities performed at the Gunnison, Colorado, Uranium Mill Tailings Remedial Action (UMTRA) Project site. Remedial action construction at the Gunnison, Colorado site was directed by the Remedial Action Contractor (RAC).

### **1.1 RADIOLOGICAL SURVEILLANCES/AUDITS**

The TAC performed radiological surveillances and audits for the DOE at the Gunnison site to provide an independent assessment that the quality of remedial action work was sufficient to ensure that the U.S. Environmental Protection Agency (EPA) standards and other site-specific health physics (HP) requirements were met. Radiological surveillances and audits complemented quality assurance (QA) surveillances, and provided assurance that the remedial action tasks were accomplished in compliance with relevant specifications and standards. Radiological surveillances and audits were performed at a frequency of one to two times per construction season. The results of the surveillances, audits, and follow-up actions are documented in Section 2.0. Table 1.1 summarizes the surveillances.

### **1.2 QUALITY ASSURANCE IN-PROCESS SURVEILLANCES**

QA in-process surveillances were performed at the Gunnison site by the TAC QA Department, under the direction of the DOE. The purpose of the QA in-process surveillances was to verify that the procedures and systems required by the respective QA programs were implemented during remedial action. The QA in-process surveillances were performed at the average frequency of one to two times per construction season. Section 3.0 documents results of the QA in-process surveillances and follow-up actions at the Gunnison site. Table 1.1 summarizes the QA in-process surveillances.

### **1.3 REMEDIAL ACTION CLOSE-OUT INSPECTION**

The remedial action close-out inspection was performed by the Quality Departments of the DOE and TAC at the Gunnison site after remedial action was complete. The inspection was performed to verify that the site was constructed in compliance with the approved remedial action plan (RAP) (DOE, 1992c), construction plans and UMTRA Project specifications. The results of the remedial action close-out inspection are documented in Section 4.0 and summarized in Table 1.1.

**Table 1.1 Summary of audits and surveillances**

Type/Date of activity	Number of observations	Date closed
<b>DOE/TAC radiological surveillances/audits</b>		
GUN-S01 16-19 September 1992	7	28 June 1993
GUN-S02 28 June to 1 July 1993	21	7 January 1994
GUN-A03 4-7 October 1993	9	16 June 1994
GUN-A04 13-16 June 1994	17	12 July 1995
GUN-A05 19-22 September 1994	13	12 July 1995
GUN-A06 10-12 July 1995	12	12 July 1995
<b>DOE/TAC QA in-process surveillances</b>		
S211 24-25 September 1992	15	14 June 1993
QS93036 7-9 July 1993	14	27 August 1993
QS93056 29 October 1993	15	8 November 1993
QS94127 27-28 June 1994	9	9 August 1994
QS94139 31 October to 1 November 1994	9	8 March 1995
QS95156 19-20 June 1995	1	23 August 1995
QS95167 20-21 July 1995	11	4 October 1995
QS95171 17-18 August 1995	11	26 September 1995
QS95173 20 September 1995	7	8 January 1996
QS95179 11-13 October 1995	8	8 December 1995
<b>DOE/TAC remedial action close-out inspections</b>		
QA95183 4-5 December 1995	20	9 January 1996 <sup>a</sup>
<b>Other audits/surveillances</b>		
NRC-01 <sup>b</sup> 1 September 1993	4	17 November 1993

<sup>a</sup>Administratively closed by M. Scoutaris of the DOE Environmental Restoration Division (ERD).

<sup>b</sup>On-site construction review (OSCR) performed by the U.S. Nuclear Regulatory Commission (NRC).

## **1.4 OTHER QUALITY ASSURANCE AUDITS/SURVEILLANCES**

Other audits or surveillances performed at the Gunnison UMTRA Project site include on-site construction reviews (OSCR) by the U.S. Nuclear Regulatory Commission (NRC). The results of the NRC OSCR are documented in Section 5.0 and summarized in Table 1.1.

## **1.5 AUDIT PROCEDURES**

Criteria and procedures for performing UMTRA Project audits and surveillances are provided in the UMTRA Project audit/surveillance program plan (DOE, 1988).

## **1.6 GENERAL STANDARDS**

In 1978, the U.S. Congress passed Public Law 95-604, the Uranium Mill Tailings Radiation Control Act (42 USC §7901 *et seq.*), declaring uranium mill tailings a potential health hazard to the public, and requiring that certain sites be designated for remedial action. The Gunnison site was included as 1 of 24 sites. The EPA was directed to promulgate radiological and nonradiological standards for decontamination of the sites. The DOE was authorized to initiate and manage the remedial actions. The NRC was charged with concurring in the remedial action before licensing the disposal sites. The standards that apply to all UMTRA Project sites, as promulgated by the EPA, are in Subparts A and B of 40 CFR Part 192.

- The standards in Subpart A are directed at controlling the stabilization of radioactive materials at the designated disposal sites and are addressed by the engineering design specifications the DOE Environmental Restoration Division (ERD) developed for the disposal sites.
- The standards in Subpart B define the conditions under which a site may be considered adequately cleaned up.

The Gunnison site will be evaluated to determine if ground water restoration is required in accordance with Subpart B of the ground water protection standards (60 FR 2854). If it is determined to be necessary, ground water restoration will be accomplished under the UMTRA Ground Water Project.



## **2.0 RADIOLOGICAL SURVEILLANCES/AUDITS**

The TAC performed two comprehensive site radiological surveillances and four comprehensive site audits for the DOE UMTRA Project at the Gunnison UMTRA Project site. These radiological surveillances/audits provided an independent assessment that the quality of remedial action work was sufficient to ensure compliance with EPA standards and DOE orders. The radiological surveillances/audits the TAC performed included, but were not limited to, a comprehensive review of the RAC's radiological/HP procedures, instrument calibration records, data management, personnel monitoring, and operational performance of the contractors and subcontractors responsible for HP remedial action work at the former uranium ore processing sites and the uranium tailings disposal cells.

### **2.1 SURVEILLANCE/AUDIT OBJECTIVES**

The TAC radiological surveillance/audit program of 1995 has evolved significantly since the surveillances/audits were first performed in 1991. The surveillance/audit process involves a complete inventory of office and site radiological conditions and the findings, observations, and recommendations are used to identify site-specific and programmatic conditions. This information then is used to identify attributes and address deficiencies to improve the overall radiological controls at the site and other sites encountering similar situations.

The information used to determine compliance with applicable procedures and requirements was obtained by interviewing RAC field personnel, reviewing office activities, and touring field facilities. Reviewing applicable records and documentation provide additional verification of HP activities.

Radiological audits/surveillances have three distinct objectives:

- Verify that remedial actions are meeting the EPA cleanup standards or other cleanup standards specified in the remedial action planning documents.
- Evaluate control methods the RAC uses to prevent overexcavation, which can increase quantities of material for disposal and potentially escalate remediation costs.
- Review the RAC's general data management methods and procedures, and provide a pathway for the exchange of ideas for technological improvements in the program.

These three objectives are provided to the DOE ERD in the form of objective evidence (comments the auditors consider appropriate for documenting topics of concern to the DOE ERD and for noting improvements in techniques and procedures).

Findings and observations presented in a radiological surveillance/audit could include, but not be limited to the following criteria:

- Noncompliance with requirements of the site RAP (DOE, 1992c), vicinity property (VP) management and implementation manual, engineering design, or UMTRA Project Team directives applicable to the site.
- Evidence that the existing radiological measurement methods may result in residual contamination levels that exceed established limits (underexcavation).
- Evidence that the existing radiological measurement methods may result in the removal of material that does not exceed contamination limits (overexcavation). The soil contamination limits are specified by EPA standards and include site-specific modifications agreed to by the NRC or mandated by DOE ERD directives for the UMTRA Project.
- Evidence that some aspects of the contractor's radiological survey plans and procedures, measurement techniques, or data management capabilities are insufficient to allow eventual certification of the site.
- Evidence that activities are not in compliance with applicable DOE orders.

Comments on proficiency, favorable comparisons, or developmental activities may be included as observations. Observations are comments considered appropriate by the auditors to document topics of concern to the DOE ERD, and to note improvements in techniques or procedures to noncritical areas.

Additional information regarding the radiological surveillance/audit activities and resolutions are provided below.

## **2.2 SURVEILLANCE/AUDIT RESULTS**

The information below was obtained from the final surveillance/audit reports and supporting documentation. The closure of a finding or observation, if not obtained via a report or cover letter, was evaluated and closed based on documented information from the RAC, recommendation from members of the surveillance/audit team, and/or follow-up site surveillances/audits.

### **2.2.1 Radiological surveillance GUN-S01**

The TAC performed the first comprehensive site radiological surveillance (GUN-S01) for the DOE in Gunnison, Colorado, on 16 to 19 September 1992 (DOE, 1992a). Representatives from the TAC included D. Gonzales and D. McCarthy. RAC personnel included M. Thomson, P. Mohrman, B. Gallagher, V. Black, L. Owen, and C. Simonson. This surveillance focused on reviews of RAC radiological procedures, instrument calibration, verification activities, and



data management. The RAC's soil sampling technique was observed and split soil samples from several 100-square meters plots on VPs. The surveillance team concluded that the HP aspects of the Gunnison, Colorado remedial action program were well organized and performed effectively according to written procedures and documentation requirements. One programmatic finding (GUN-S01-F01) and seven site-specific observations (GUN-S01-O01 through -O07) were identified. Programmatic finding GUN-S01-F01 and observations GUN-S01-O03 and GUN-S01-O07 required responses from the RAC. Neither the finding nor the observations impacted the RAC's ability to ensure compliance with EPA standards.

Programmatic finding GUN-S01-F01 identified that a revision was needed for the site-specific emergency action plan for the Gunnison UMTRA Project.

Site-specific observation GUN-S01-O03 requested that Morrison Knudsen-Ferguson (MK-F) justify using a conservative, generic opposed crystal system (OCS) correction factor of 2.0 instead of 1.8 to relate estimated, equilibrated, 20-day radium-226 concentrations based on initial gamma spectroscopy analysis for the limited number of VPs completed or under remediation.

Site-specific observation GUN-S01-O07 requested that MK-F set up and calibrate for routine or periodic thorium-232 analysis simultaneously with the radium-226 assessment. Additionally the thorium-232 results should be calculated and entered into the OCS log book.

During the radiological surveillance of 28 June 1993, the above corrective actions were reviewed. The DOE, at the conclusion of Gunnison radiological surveillance GUN-S02, deemed the corrective actions acceptable, thereby closing this surveillance.

### **2.2.2 Radiological surveillance GUN-S02**

The TAC performed the second comprehensive site radiological surveillance (GUN-S02) for the DOE in Gunnison on 28 June to 1 July 1993 (DOE, 1993a). The DOE ERD was represented by R. Cornish and F. Bosiljevac. Representatives from the TAC included J. Hylko and B. James. RAC personnel participating in the surveillance included J. Innis (site manager), R. Jacobs (HP manager), and R. Peirce (QA coordinator for Chemical Waste Management Federal Environmental Services). This surveillance focused on reviews of RAC procedures, instrument calibration, QA control, environmental monitoring stations, site contamination control, decontamination of trucks, collection of environmental samples, training of personnel, review of HP monitoring plan, and data management/analysis. The surveillance team verified that the HP aspects of the remedial action program were well organized and performed effectively according to written procedures and documentation requirements. Twenty-one site-specific findings/observations were identified during this surveillance. One programmatic finding (GUN-S02-F01) and 12 site-specific observations (GUN-S02-O02 through -O21) were identified. Programmatic finding

GUN-S02-F01 and observations GUN-S02-002, -005, -007, -010, -013, -014, -015, -016, -018, -019, -020, and -021 required responses from the RAC. Neither the finding nor the observations impacted the RAC's ability to ensure compliance with EPA standards.

Programmatic finding GUN-S02-F01 identified that a revision was needed for the procedure dealing with radon monitoring with radon gas monitors (RGM).

Site-specific observation GUN-S02-002 recommended that the posting for surface contamination at the Gunnison site entrances should be relocated to accurately reflect the radiological status of the immediate area.

Site-specific observation GUN-S02-005 recommended that the negative bias in the OCS should be investigated and corrected.

Site-specific observation GUN-S02-007 recommended that MK-F determine if a project interface document (PID) should be prepared to document the new approach for handling haul truck decontamination.

Site-specific observation GUN-S02-010 acknowledged that MK-F had implemented a training transcript to replace actual training records and documentation currently stored at the Gunnison Project site.

Site-specific observation GUN-S02-013 noted that the ending flow rates for air particulate sampling either approached or exceeded the  $\pm 15$  percent flow limit. The surveillance team recommended that MK-F continue to monitor this trend and take action, if necessary, to resolve it.

Site-specific observation GUN-S02-014 recommended that MK-F consider distributing the MK-F approved vendors list to all site HP managers.

Site-specific observation GUN-S02-015 acknowledged that MK-F had implemented a practice of maintaining the names, initials, and signatures of HP personnel at all UMTRA sites.

Site-specific observation GUN-S02-016 recommended that MK-F post pertinent HP instrument information (e.g., instrument, check source, acceptable count range, and calibration due date) at all UMTRA Project sites. This type of posting saves time and effort that normally would be used to search through HP instrumentation files.

Site-specific observation GUN-S02-018 recommended that MK-F consider having all drivers who haul tailings display their valid driver's license and medical examination card in the lower right-hand corner of the driver's side window.

Site-specific observation GUN-S02-019 recommended that MK-F consider revising their computer program to perform all required calculations, and print

out the heading, decay correction date, source serial number, assay date, and activity in disintegrations per minute for strontium/yttrium-90.

Site-specific observation GUN-S02-O20 identified inconsistencies in MK-F procedure RAC-IN-001, Revision 0, ICN-01, relating to the certificate of calibration, calibration labels, Chi-square ranges, and the determination of high voltage plateau settings. The surveillance team recommended that MK-F consider replacing the calibration label in accordance with the MK-F standard operating procedure (SOP). The RAC should consider resolving the inconsistencies between Chi-square values related to the UMTRA HP instrumentation program and the Canberra Alpha/Beta System. The RAC should consider revising the SOP for the Ludlum 1000s to incorporate the various characteristics of these instruments (e.g., Ludlum 1000s cannot distinguish 25-volt increments on the high-voltage scale, and can only approximate 50-volt increments).

Site-specific observation GUN-S02-O21 recommended that MK-F identify the inconsistencies between the HP monitoring plan and SOPs. The inconsistencies may not justify the revision of the HP monitoring plan.

In a letter dated 7 January 1994 (Ulland, L., 1994a) the TAC recommended that the DOE close the surveillance. The DOE, at the conclusion of Gunnison audit GUN-A03, deemed the corrective actions acceptable, thereby closing this surveillance.

### **2.2.3 Radiological audit GUN-A03**

The TAC performed the first comprehensive site radiological audit (GUN-A03) for the DOE at the Gunnison sites on 4 to 7 October 1993 (DOE, 1993b). R. Cornish represented the DOE. J. Hylko, TAC health physicist, and M. Bradshaw, TAC regulatory specialist, represented the TAC. RAC personnel included J. Innis, site manager, and R. Jacobs, site HP manager. This audit reviewed contamination control, labeling of containers, decontamination pad activities, site-specific open observations from the previous audit (e.g., calibration of RGMs, postings, OCS performance, and others), food in truck cabs, radiological postings, frisking, and cobbles-to-fines protocol. The audit team concluded that most radiological aspects of the Gunnison RAP (DOE, 1992c) were performed adequately. Twenty-five site-specific findings/observations were identified during this surveillance. Three programmatic findings, five site-specific observations, and seven recommendations were identified. The programmatic finding GUN-A03-F01, -F02, and -F03, and observations GUN-A03-O01, -O02, -O03, -O04, and -O05 required responses from the RAC. Neither the findings nor the observations impacted the RAC's ability to ensure compliance with EPA standards.

Programmatic finding GUN-A03-F01 identified six violations of contamination control procedures. The violations ranged from individuals exiting their hauling unit in a controlled area, placing indelible markers in their mouth in a controlled

area, a food container was found in a trash receptacle labeled for radioactive waste, quality control (QC) personnel without protective gloves were observed working in the disposal cell, radioactive smears were observed in a coverless bucket used as a trash receptacle in the disposal cell and was identified as a potential release for smears to disperse outside of the controlled area, and workers without protective gloves on the decontamination pad were observed repairing a hose nozzle fitting.

Programmatic finding GUN-A03-F02 identified the need to label containers to avoid creating mixed wastes. The audit team recommended that the RAC consider developing a section in the HP procedures to address proper labeling of containers used to store radioactive materials.

Programmatic finding GUN-A03-F03 identified the need for additional training on the decontamination practices. The audit team recommended that the decontamination facility supervisor should review current decontamination practices to ensure compliance with applicable requirements in procedure RP-003-3.

Site-specific observation GUN-A03-O01 identified the remaining items left open from the previous surveillance conducted on 28 June to 1 July 1993 (DOE, 1993a). The audit team recommended that the RAC extract the useful information from the discussions on the open items to address the remaining observations and formally request closure by DOE for the remaining open items.

Site-specific observation GUN-A03-O02 identified the need for the truck drivers hauling tailings to store their food outside of the controlled areas or the RAC should not allow the drivers to exit their cabs in the controlled areas under any circumstances. The surveillance team cited the allowance of food into a controlled area as a contradiction of good radiological practices.

Site-specific observation GUN-A03-O03 recommended the RAC consider evaluating the radiological posting requirements to ensure postings are consistent with the site radiological control maps.

Site-specific observation GUN-A03-O04 recommended the RAC consider situating the frisking instrumentation and the radiological demarcation line so personnel exiting a controlled area can step across the radiological demarcation line as each foot is surveyed, thereby preventing the inadvertent spread of contamination.

Site-specific observation GUN-A03-O05 verified that additional site characterization is necessary to determine the use of the cobbles-to-fines protocol.

Site-specific observation GUN-A03-O06 identified two noteworthy practices associated with contamination control. The noteworthy practices were for the two memorandums issued by the site HP manager to all site personnel regarding

radiological trash and HP reminders. Additionally the supervisor for the decontamination pad now keeps a record of every truck that passes through the decontamination pad.

In a letter dated 11 April 1994 (Ulland, L., 1994b), the TAC recommended the DOE close the surveillance with the exception of observations GUN-A03-002, and -003. GUN-A03-002 and -003 required visual verification. The DOE, at the conclusion of Gunnison audit GUN-A04, deemed the corrective actions acceptable and closed this surveillance.

#### **2.2.4 Radiological audit GUN-A04**

The TAC performed the second comprehensive site radiological audit (GUN-A04) for the DOE at the Gunnison site on 13 to 16 June (DOE, 1994a). R. Cornish represented the DOE ERD, and J. Hylko and M. Brennan represented the TAC. RAC personnel included S. McQueary, B. Shaw, and J. Cosgrove. This audit focused on excavation control (RAC-OP-002), access control (RP-003-2), respirator issue and maintenance (RP-003-5), decontamination of haul trucks (RP-003-3), protective clothing requirements for working in radiological areas (RP-003-6), environmental monitoring for radionuclides (RAC-RP-001), environmental air particulate monitoring (RP-001-4), environmental air water monitoring (RP-001-5), sealed radioactive source accountability (RAC-RP-008), operation of the OCS, and a noteworthy practice. The audit team concluded that the radiological aspects of the Gunnison remedial action programs were performed effectively according to written procedures and documentation requirements. Three site-specific observations were identified during the audit. Observations GUN-A04-003a, -003f, and -003g required responses from the RAC. None of the observations impacted the RAC's ability to ensure compliance with EPA standards.

Site-specific observation GUN-A04-003a recommended that the RAC should consider incorporating basic access control topics into the daily or weekly safety meetings. Items such as contamination control and segregation of waste/posting requirements should be on the agenda.

Site-specific observation GUN-A04-003f recommended that the RAC should consider performing routine surveys of "open" truck or heavy equipment cabs to prevent the buildup of radioactive contamination.

Site-specific observation GUN-A04-003g recommended that the RAC consider posting mandatory handwashing requirements for all personnel exiting a controlled area.

Close-out of this audit was completed during the close-out of GUN-A06. See Section 2.2.6 for close-out information.

## **2.2.5 Radiological audit GUN-A05**

The TAC performed the third comprehensive site radiological audit (GUN-A05) for the DOE at the Gunnison sites on 19 to 22 September 1994 (DOE, 1994b). R. Cornish represented the DOE and M. Bradshaw and M. Brennan represented the TAC. RAC personnel included S. McQueary, B. Shaw, and J. Cosgrove. This audit focused on the review external dosimetry program (RAC-RP-007), access control (RP-003-1), personnel monitoring, contamination reporting and decontamination (RP-003-2), environmental air particulate monitoring (RP-001-4), long-lived gross alpha and thorium-230 monitoring (RP-002-1), radiological control posting procedure (RP-003-7), UMTRA HP instrumentation program (RAC-IN-001), general HP items, contamination monitoring in uncontrolled areas (RP-003-4), and operation of the OCS. The audit team concluded that the radiological aspects of the Gunnison remedial action programs were performed effectively according to written procedures and documentation requirements. Eight site-specific observations were identified during the audit. Seven observations (GUN-A05-002b, -002c, -003b, -004a, -004b, -006a, and -006b) required responses from the RAC. None of the observations impacted the RAC's ability to ensure compliance with EPA standards

Site-specific observation GUN-A05-002b, recommended that MK-F consider performing air sampling along the fence line of the water retention basin. However, if the source of material for resuspension is variable, then sampling would need to occur when maximum concentrations exists (e.g., dry sediment). This necessitates an understanding of when such conditions occur. Periodically washing the dried sediment down to the low end of the pond or maintaining the level of water in the pond at a level which keeps the sediment moist (or actually submerged) constitutes a practical alternative to monitoring by reducing the possibility for resuspension, consequently eliminating potentially significant exposures from this source.

Site-specific observation GUN-A05-002c recommended that the RAC consider developing specific procedural guidelines for the collection of sediment samples, in conjunction with environmental water monitoring procedural requirements. These guidelines could be incorporated into procedure RP-001-5, or as a stand-alone procedure (e.g., RP-001-6).

Site-specific observation GUN-A05-003b recommended that the RAC consider cleaning the tailings material on a regular basis, such as following all truck inspections when large clumps of tailings are deposited on the ground. If this is impractical, it is suggested that a frequency be established so that significant buildups in the future are unlikely, such as at the end of each work day. It is recognized that the tailings have essentially been removed from the processing site area, however, since radium and thorium cleanup of the subpile is incomplete, the policy remains advisable from as low as reasonably achievable and is a good housekeeping practice.

Site-specific observation GUN-A05-004a recommended first that the RAC consider giving the site HP manager authority for determining posting requirements. Second, the RAC should consider that the posting of areas not meeting the contamination or exposure control criteria (i.e., "over posting") should be discouraged.

Site-specific observation GUN-A05-004b recommended that the RAC remove the high efficiency particulates in air (HEPA) labels from the exterior of the vacuums and use the present HEPA-type filters without dioctyl phthalate (DOP) testing. No credit would be taken or certification made that the filters are capable of a 99.9 percent efficiency. This would eliminate the need for costly DOP testing while allowing the use of the existing HEPA filters. The RAC should also consider removing or defacing the hazardous material label posted on the exterior of the vacuums because residual radioactive material (i.e., tailings) is not identified as a hazardous material.

Site-specific observation GUN-A05-006a recommended that the RAC site HP manager heighten awareness of workers for unlabeled containers and commended the site HP personnel who took prompt action in labeling a 70-gallon container of deionized water located in the sample preparation tent.

Site-specific observation GUN-A05-006b recommended that the RAC improve routine housekeeping in the vicinity of the decontamination pads. A similar observation was identified in GUN-A04-003a.

Close-out of this audit was completed during the close-out of GUN-A06. See Section 2.2.6 for close-out information.

## **2.2.6     Radiological audit GUN-A06**

The TAC performed the fourth comprehensive site radiological audit (GUN-A06) for the DOE at the Gunnison site on 10 to 12 July 1995 (DOE, 1995a). R. Cornish represented the DOE, J. Hylko represented the TAC, and T. Lehmann represented the RAC. At the time of this audit, the MK-F radiological program for the Gunnison Project was almost completed. All radiological concerns were completed except for the radon flux measurements that were in progress. This audit focused on the review of previous Gunnison observations and findings from radiological audits GUN-A04 and GUN-A05; 40 CFR Part 61, Subpart T (NESHAP)/*Radon Flux Measurements* (OP-003-5, Rev. 1); *Verification Soil Sampling* (OP-003-1, Rev. 1, ICN-01); access control on the disposal cell, and air particulate sampling. The audit team concluded that the radiological aspects of the Gunnison remedial action programs were performed effectively according to written procedures and documentation requirements. Twelve observations were made during this radiological audit. None of the observations required a response.

Additionally, open observations or findings from radiological audits GUN-A04 and GUN-A05 were reviewed. The review verified that corrective actions had been implemented for all observations and findings from previous audits.

At the exit meeting for this radiological audit the DOE accepted the RAC's corrective actions for all observations and findings made during remedial action construction activities. Therefore, the DOE closed out all open issues for the radiological audit program at the Gunnison UMTRA Project site.

## **2.3 SUMMARY AND CONCLUSIONS**

Two comprehensive site radiological surveillances and four comprehensive radiological audits were performed at the Gunnison, DOE UMTRA Project site during remedial action activities. The radiological surveillances and audit teams concluded that the HP aspects of the remedial action program were organized and performed according to written procedures and documentation requirements. The final resolution of findings and observations in follow-up surveillances/audits and separate correspondence verified that all issues have been resolved to the satisfaction of the DOE ERD. All surveillances are considered closed by the DOE ERD.



### 3.0 QUALITY ASSURANCE IN-PROCESS SURVEILLANCES

The DOE and TAC performed ten QA in-process surveillances at the Gunnison UMTRA Project site. The in-process surveillances were performed to ensure that the RAC properly implemented approved construction plans and specifications. The in-process surveillances were independent of the organizations performing the work and did not relieve the RAC from its own QC requirements. The QA in-process surveillances were performed by a team consisting of at least one representative from the DOE and one QA TAC lead auditor.

The DOE/TAC QA in-process surveillance reports included observations and recommendations. Observations were comments considered appropriate by the auditors for documenting topics of concern to the DOE and for noting improvements in techniques or procedures to noncritical areas. Comments on proficiency, favorable comparisons, or developmental activities were included as observations. Recommendations were made for observations that did not meet project requirements or where a best management practice would improve work processes.

#### 3.1 SURVEILLANCE OBJECTIVES

The QA in-process surveillances had three objectives:

- Verify RAC compliance with the approved RAP for the Gunnison site. The surveillance team accomplished this objective by reviewing the approved Gunnison RAP (DOE, 1992c) and preparing checklists of key construction activities.
- Verify RAC compliance with approved plans and specifications. The surveillance team accomplished this by reviewing site documentation and observing construction activities from established checklists.
- Verify that the Gunnison remedial action inspection plan (RAIP) (MK-F, 1994) was implemented. The surveillance team accomplished this objective by observing testing and inspection activities performed by the RAC's QC technicians in the field.

#### 3.2 SURVEILLANCE RESULTS

The results of the QA in-process surveillances performed at the Gunnison site are summarized below.

##### 3.2.1 Surveillance S211

This QA in-process surveillance was performed on 24 to 25 September 1992 (DOE, 1992b) at the Gunnison site. The surveillance team consisted of M. Scoutaris of the DOE and P. Pehrson of the TAC. The surveillance resulted in 15 observations, three of which, observations 4, 6, and 15, required a

response from the RAC. The surveillance team reviewed field and laboratory reports and observed activities for the construction of the clean fill dikes at the Gunnison disposal cell and water retention basin and realignment of Gold Basin Road at the Gunnison processing site.

Observation 4 requested that a letter be issued from MK-F to the contractor (Ames Construction) stating that the maintenance and repair of Tenderfoot Mountain haul road during the length of the contract will be the responsibility of Ames Construction. Additionally, the contractor was asked to respond as to why testing was deleted in the approval process and why State of Colorado Highway Specifications and Standards were initially specified, then removed from the contract requirements.

Observation 6 asked MK-F to provide documentation of washed gradations or an explanation of exemption. This item remained open until the approval of PID 08-S-05.

Observation 15 asked MK-F to provide the DOE ERD with an audit schedule for the Gunnison Project.

The DOE closed this QA surveillance on 14 June 1993.

### **3.2.2 Surveillance QS93036**

This QA in-process surveillance was performed on 7 to 9 July 1993 (DOE, 1993c) at the Gunnison site. The surveillance team consisted of M. Scoutaris of the DOE and P. Pehrson of the TAC. The surveillance resulted in 14 observations with no recommendations issued or responses required. Field observations were conducted at the processing and disposal cell. The surveillance team reviewed field and laboratory reports for construction activities, observed construction activities, and observed QC testing at the Gunnison disposal cell.

The DOE closed this QA surveillance on 27 August 1993.

### **3.2.3 Surveillance QS93056**

This QA in-process surveillance was performed on 29 October 1993 (DOE, 1993d) at the Gunnison site. The surveillance team consisted of M. Scoutaris of the DOE and P. Pehrson of the TAC. The surveillance resulted in 15 observations with no recommendations issued or responses required. The Gunnison surveillance consisted of site tours, interviews of site QC personnel, inspection of the MK-F QC laboratory, examination of QC records, and observations of construction activities at the disposal cell and/or processing site.

The DOE closed the surveillance on 8 November 1993.

#### **3.2.4     Surveillance QS94127**

This QA in-process surveillance was performed on 27 to 28 June 1994 (DOE, 1994c) at the Gunnison site. The surveillance team consisted of M. Scoutaris of the DOE and P. Pehrson of the TAC. The surveillance resulted in nine observations with no recommendations issued or responses required. The Gunnison surveillance consisted of site tours, interviews of site QC personnel, examination of on-site quality documentation, and observation of construction activities at the disposal cell and processing site.

The DOE closed the surveillance on 9 August 1994.

#### **3.2.5     Surveillance QS94139**

This QA in-process surveillance was performed on 31 October to 1 November 1994 (DOE, 1994d) at the Gunnison site. The surveillance team consisted of M. Scoutaris of the DOE and P. Pehrson of the TAC. The surveillance resulted in 9 observations, one of which, observation 9, required a response from the RAC. During the on-site inspection at the processing site and disposal cell, the surveillance team observed the contractor placing and compacting Type A select fill in the west embankment of the disposal cell. All of the contaminated material such as tailings and subpile material had been hauled to the disposal cell. The only contaminated material left was the wash-down facility from the processing site and disposal cell. The QC laboratory was inspected and QC records of remedial construction activities were reviewed. The surveillance team also visited the Chance Gulch Quarry where erosion protection material was being produced.

Observation 9 requested that MK-F include the geologist's (J. Cercone) site inspection report of 2 to 3 November 1994 in response to this observation.

The DOE closed the surveillance on 8 March 1995.

#### **3.2.6     Surveillance QS95156**

This QA in-process surveillance was performed on 19 to 20 June 1995 (DOE, 1995b) at the Gunnison site. The surveillance team consisted of M. Scoutaris of the DOE and R. Papusch of the TAC. The surveillance resulted in one observation with no recommendations issued or responses required. An on-site inspection was performed at the Gunnison processing site and disposal cell. The surveillance team observed the contractor's start-up of the radon barrier pug mill mixing and placement activities, reviewed QC test and inspection records detailing QC activities, and inspected the field laboratory and equipment.

The DOE closed this surveillance on 23 August 1995.

### **3.2.7     Surveillance QS95167**

This QA surveillance was performed on 20 to 21 July 1995 (DOE, 1995c) at the Gunnison site. The surveillance resulted in 11 observations with no recommendations issued and no recommendations requiring a RAC response. The surveillance team consisted of M. Scoutaris of the DOE and P. Pehrson of the TAC. An on-site inspection was performed at the Gunnison processing site and disposal cell. MK-F QC personnel were interviewed and observed performing field QC tests. The contractor's construction activities were also observed. QC tests and inspection records detailing QC activities associated with the remediation process at the Gunnison site were reviewed.

The DOE closed this surveillance on 4 October 1995.

### **3.2.8     Surveillance QS95171**

This surveillance was performed on 17 to 18 August 1995 (DOE, 1995d) at the Gunnison site. The surveillance team consisted of M. Scoutaris of the DOE and P. Pehrson of the TAC. The surveillance resulted in 11 observations with no recommendations issued and no recommendations requiring a RAC response. The surveillance team reviewed QC tests and records detailing QC activities associated with radon barrier placement at the disposal cell. Additionally, the surveillance team met with J. Cercone of Morrison Knudsen-Environmental Government Group (MK-EGG) and C. Spencer of MK-F and reviewed the production and quality of the riprap material at the Chance Gulch Quarry.

The DOE closed the surveillance on 26 September 1995.

### **3.2.9     Surveillance QS95173**

This surveillance was performed on 20 September 1995 (DOE, 1995e) at the Gunnison site. The surveillance team consisted of M. Scoutaris of the DOE and R. Papusch of the TAC. The surveillance resulted in seven observations. Observation 7 had a recommendation that required a response. The surveillance team reviewed test and inspection records and observed the placement of bedding material on the top of the disposal cell.

Observation 7 requested that copies of the documentation verifying that rutting was repaired be forwarded to DOE ERD for review.

The DOE concurred with the RAC's response to observation 7 and closed the surveillance in a memo to the RAC dated 8 January 1996.

### **3.2.10    Surveillance QS95179**

This surveillance was performed on 11 to 13 October 1995 (DOE, 1995f) at the Gunnison site. The surveillance team consisted of M. Scoutaris of the DOE and P. Pehrson of the TAC. The surveillance resulted in eight observations with no

recommendations issued and no recommendations requiring a RAC response. The surveillance team reviewed test and inspection records and observed the placement of bedding Type B and C riprap material on the slopes and anchor ditch of the disposal cell.

The DOE closed the surveillance in a memo to the RAC dated 8 December 1995.

### **3.3 SUMMARY AND CONCLUSIONS**

The DOE and TAC performed 10 QA in-process surveillances at the Gunnison site for remedial construction activities. The surveillance teams concluded that the RAC remedial construction activities were performed in compliance with Gunnison RAP, RAIP and project specifications. The surveillances resulted in 100 observations. Five observations had recommendations that required RAC responses. Ninety-five observations had recommendations that required no response. All recommendations that required responses were resolved and closed to the satisfaction of the DOE ERD. All the surveillances were considered closed by the DOE ERD on 8 January 1996.



## 4.0 REMEDIAL ACTION CLOSE-OUT INSPECTION

The DOE/TAC performed a remedial action close-out inspection at the Gunnison site to ensure that remedial action was performed according to approved construction plans and specifications. The remedial action close-out inspection for the Gunnison UMTRA Project site was performed on 4 to 5 December 1995 (DOE, 1995g). The DOE/TAC inspection team included M. Scoutaris of the DOE ERD and P. Pehrson of the TAC. S. Arp of the DOE ERD was an observer for this close-out inspection. MK-F personnel included R. Hindman, D. Thompson, B. Brow, T. Harrell, and C. Walters. F. Guros represented MK-EGG. W. Naugle represented the Colorado Department of Public Health and Environment (CDPHE).

The results of the final close-out inspection is documented in DOE/TAC Report No. QA95183 (DOE, 1995g).

### 4.1 REMEDIAL ACTION CLOSE-OUT INSPECTION OBJECTIVES

The objective of the remedial action close-out inspection was to determine if the degree of completion of the Gunnison site is in accordance with the approved site construction plans and specifications, latest editions of the Gunnison RAP (DOE, 1992c), RAIP, design specifications, and RAC final walk-over items from its punch list.

### 4.2 REMEDIAL ACTION CLOSE-OUT INSPECTION RESULTS

The DOE/TAC inspection teams held an opening meeting with representatives of DOE, MK-F, MK-EGG, and CDPHE at the Gunnison UMTRA Project construction office. The opening close-out inspection meeting was held at 1 p.m. on 4 December 1995 (DOE, 1995g). The meeting consisted of introductions, schedule of inspection, and discussions of the MK-F final walk-over inspection punch list and open punch list items. The MK-F punch list included all items the RAC inspected and reviewed for the Gunnison site on 4 December 1995. The RAC close-out inspection checklist verified that 19 items remained open and need to be completed at the Gunnison site before the final inspection could be closed. One additional item was added as a result of the DOE/TAC inspection. The 19 punch list items and the one additional item are listed below.

#### 4.2.1 Long-term surveillance plan

- A. MK-F needs to install two site markers for each site. *This is scheduled to be completed during the last week of December or first week of January.*
- B. MK-F needs to complete aerial photography and mapping. *This will be handled under a separate contract and is scheduled to be completed in May or June of 1996. The exact date cannot be set at this time because the winter snowfall and spring thaw cannot be predicted.*

#### **4.2.2     Office and staging area**

- A. The removal of contractor trailers at the processing site. ***MK-F is scheduled to move their trailers around the end of February 1996.***
- B. The removal of the subcontractor trailers at the processing site. ***The subcontractor's (Ames Construction) trailers are scheduled to be removed from the processing site on 7 December 1995.***
- C. The removal of the wastewater storage tank at the processing site. ***The wastewater storage tank is scheduled to be removed when the subcontractor's trailer is removed from the processing site on 7 December 1995.***
- D. The removal of the portable chemical toilet from the disposal cell. ***The portable chemical toilet is scheduled to be removed from the disposal cell on 7 December 1995.***

#### **4.2.3     Erosion protection materials**

- A. MK-F needs to obtain the remainder of the durability scoring sign-off sheets from MK-EGG for the bedding, Types A, B, C, and D riprap materials. ***This is scheduled to be completed by the last of January or no later than the middle of February 1996.***
- B. ***DOE added item:*** MK-F needs to obtain the durability test results for Type D riprap (scheduled to be completed no later than mid-February 1996) and develop the rock score. Additionally, MK-F will have to obtain sign-off sheets of approval for durability scoring from MK-EGG.

#### **4.2.4     Site restoration**

- A. Complete final grading and seeding for the disposal cell. ***Scheduled to be completed on 5 December 1995.***
- B. Complete final grading and seeding for the permanent access road. ***Scheduled to be completed on 6 December 1995.***
- C. Complete final grading and seeding for the 6-mile borrow area drainage channels. ***Scheduled to be completed by 7 December 1995.***
- D. Reclaim Chance Gulch Quarry and haul road. ***Hand seeding the remaining areas of the Chance Gulch Quarry is scheduled to be completed on 6 December 1995. Additionally, MK-F will obtain a letter of acceptance from the Bureau of Land Management for the permanent access road, Chance Gulch Quarry and Chance Gulch Quarry haul road, and Tenderfoot Mountain haul road. A copy of the letter will be sent to S. Arp of the DOE ERD.***



#### **4.2.5      Miscellaneous**

- A. MK-F will need to verify the removal of all survey lath, miscellaneous trash, material safety data sheet boxes, garbage cans, traffic control signs and DOE "NO TRESPASSING" signs at all sites. ***Scheduled to be completed by 8 December 1995. Will be verified on 11 December 1995.***

#### **4.2.6      Survey for as-built and quantity**

- A. Complete the survey verification for Type B riprap material on the northwest 3:1 slope and Type C material in the toe ditches. ***Scheduled to be completed early January 1996.***
- B. Complete the survey of the Type C and D riprap material in the north diversion ditch. ***Scheduled to be completed early January 1996.***
- C. Complete survey of the final site grading at the disposal cell. ***Scheduled to be completed early January 1996.***
- D. Perform an as-built survey of the survey and boundary monuments and site markers. ***Scheduled to be completed late December 1995 or early January 1996.***

#### **4.2.7      Haul road - private property issues**

- A. Install the cattle guard at the interface between the Wilson property and the City of Gunnison property along the Tenderfoot Mountain haul road. ***Scheduled to be completed on 6 December 1995.***
- B. The paved section of the Tenderfoot Mountain haul road needs to have the shoulder dressed up. ***Scheduled to be completed on 8 December 1995.***
- C. Repair the gate at the access road between Gold Basin Road and Tenderfoot Mountain haul road. ***Scheduled to be completed on 8 December 1995.***

#### **4.3              SUMMARY AND CONCLUSIONS FOR THE REMEDIAL ACTION CLOSE-OUT INSPECTION**

The DOE/TAC Gunnison remedial action close-out inspection performed on 4 to 5 December 1995 (DOE, 1995g) resulted in 20 open items. On 9 January 1996, M. Scoutaris, DOE ERD QA manager for the UMTRA Project, administratively closed the remedial action close-out inspection for the Gunnison UMTRA Project. Documentation of completion for each of the 20 open items will need to be sent to M. Scoutaris. Verification of completion for open items, to the DOE's satisfaction, will be determined by S. Arp or M. Scoutaris of the DOE ERD.



## **5.0 OTHER AUDITS AND CONSTRUCTION REVIEWS**

### **5.1 ON-SITE CONSTRUCTION REVIEW OBJECTIVES**

This section covers OSCRs performed by the NRC. The NRC performed one OSCR during the Gunnison UMTRA Project remedial action construction activities. This OSCR was performed on 1 September 1993 (NRC, 1993). No other site-related construction audits, except RAC internal audits, were performed at the Gunnison site. The RAC's site-related audits are referenced in the Gunnison completion report (MK-F, 1996).

The NRC OSCR involved a 1-day site visit. During this OSCR, materials, records, and construction activities were verified using the approved RAP, RAIP, and construction specifications for the Gunnison UMTRA Project sites.

### **5.2 ON-SITE CONSTRUCTION REVIEWS**

The NRC OSCRs had three distinct objectives. First, assess the effectiveness of the construction and QC programs to ensure compliance with the RAP (DOE, 1992c) and EPA standards. Second, verify compliance with the RAIP- and RAP-approved plans and specifications. These two objectives were accomplished by reviewing documentation and observing construction activities as they were performed. Finally, verify that the approved RAIP (MK-F, 1994) for the Gunnison site was being implemented. This was accomplished by qualified personnel witnessing the RAC QC staff perform testing and inspection activities in the field.

### **5.3 NRC ON-SITE CONSTRUCTION REVIEW RESULTS**

OSCR results in the NRC reports are documented as observations and issues. The results of the OSCR performed at the Gunnison UMTRA sites included four observations and no issues. Observations focused on removal of tailings from the processing site, placement and compaction of tailings at the disposal cell, records review, and quality of the Tenderfoot Mountain haul road. The observations are summarized in the OSCR performed by D. Rom of the NRC on 1 September 1993 (NRC, 1993). Other participants included S. Hamp of the DOE, L. Bruskin of the CDPHE, and T. Harrell of the RAC.

#### **5.3.1 Observations, 1 September 1993**

##### **Processing site**

The OSCR inspection team noted that most of the mill structure debris had been removed from the processing site to the disposal cell. Tailings were being excavated from the edge of the tailings pile near the airport. An area of gray slimes with yellow partings was observed in the face of the pile. D. Rom was

informed that this area would be evaluated for possible high radiation concentrations.

To facilitate the removal of tailings a conveyor belt systems had been constructed. The conveyor belt system, when operational, reduced the contamination of trucks, and shortened the required decontamination process. A larger conveyor belt is scheduled to be brought in to replace the current belt. The larger conveyor belt will facilitate quicker loading and may reduce downtime of the system.

Bulking of tailings was occurring within the haul trucks making it difficult for the trucks to discharge their contents at the disposal cell. Laborers were hammering the sides of the trucks to facilitate the release of tailings. MK-F was experimenting with vibrating equipment to eliminate the need to hammer on the trucks. Minor leakage problems associated with the haul trucks was also being corrected by MK-F.

#### Haul road

The OSCR team traveled the Tenderfoot Mountain haul road from the processing site to the disposal cell. The road was serviceable, and no excessive dust problems were noted.

#### Disposal cell

Tailings were being placed in the disposal cell by means of a belt feeder. A substantial amount of building debris had been stockpiled within the cell limits. Belly-dump trucks discharged their contents into a hopper, constructed in the west embankment, that transported the material to the cell. This operation helped minimize truck contamination and sped up the cycle of tailings placement. The larger debris were to be mixed with tailings in accordance with specification requirements.

D. Rom conducted informal interviews with MK-F personnel as observations were made at the disposal cell. D. Rom concluded that the MK-F representatives were knowledgeable of project requirements and status.

#### Records review

D. Rom reviewed QC reports at MK-F's QC office. The report frequency was in accordance with specifications and the RAIP (MK-F, 1994). The reports were considered adequate in content and thoroughness.

At the close of the OSCR, D. Rom met with DOE and RAC representatives. No open issues were generated from this visit. This OSCR was closed on 17 November 1993.

## **5.4 SUMMARY AND CONCLUSIONS**

Documentation from the NRC OSCR (NRC, 1993) verified that no open issues resulted from the site visit. At this time no OSCR observations require a response. Therefore the OSCR from 1 September 1993 is considered resolved to the satisfaction of the DOE ERD. This NRC OSCR is considered closed by the DOE ERD.



## 6.0 SUMMARY AND CONCLUSIONS

Two radiological surveillances, four radiological audits, ten QA in-process surveillances, and one remedial action close-out inspection were performed by the DOE/TAC during remedial action construction activities at the Gunnison UMTRA Project site. One NRC OSCR was performed during remedial action construction activities at the Gunnison UMTRA Project site. A total of 199 observations/findings were noted during DOE/TAC audit and surveillance activities. Four observations were noted during the NRC OSCR. Follow-up to responses required from the RAC for the DOE/TAC surveillance and audit observations indicated that all issues related to the Gunnison site were resolved and closed to the satisfaction of the DOE ERD.

All audit and surveillance observations and recommendations have been closed out to the DOE ERD's satisfaction. Therefore, this final audit report segment of the site certification process is complete.





## 7.0 LIST OF CONTRIBUTORS

The following individuals contributed to the preparation of this report.

Name	Contribution
J. McBee	Document sponsor
P. Pehrson	Document coordinator
P. Pehrson	Primary authors
J. McBee	Document review
R. Papusch	Quality assurance review
D. Kahl	Editing
L. Sanchez	Text processing



## 8.0 REFERENCES

- DOE (U.S. Department of Energy), 1995a. *Radiological Audit of Remedial Action Activities at the Gunnison, Colorado, Site, 10-12 July 1995, Report GUN-A06*, prepared for the U.S. Department of Energy, Environmental Restoration Division, UMTRA Project Team, Albuquerque, New Mexico, UPDCC File Location No. 8.18.5.
- DOE (U.S. Department of Energy), 1995b. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 19-20 June 1995, Report QS95156*, prepared for the U.S. Department of Energy, Environmental Restoration Division, UMTRA Project Team, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1995c. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 20-21 July 1995, Report QS95167*, prepared for the U.S. Department of Energy, Environmental Restoration Division, UMTRA Project Team, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1995d. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 17-18 August 1995, Report QS95171*, prepared for the U.S. Department of Energy, Environmental Restoration Division, UMTRA Project Team, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1995e. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 20 September 1995, Report QS95173*, prepared for the U.S. Department of Energy, Environmental Restoration Division, UMTRA Project Team, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1995f. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 11-13 October 1995, Report QS95179*, prepared for the U.S. Department of Energy, Environmental Restoration Division, UMTRA Project Team, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1995g. *Report of Remedial Action Close-Out Inspection of the MK-Ferguson Company Remedial Action Construction, UMTRA Project, Gunnison, Colorado, Site, 4-5 December 1995, Report No. QA95183*, prepared for the U.S. Department of Energy, Environmental Restoration Division, UMTRA Project Team, Albuquerque, New Mexico, UPDCC File Location No. 8.13.2.3,.
- DOE (U.S. Department of Energy), 1994a. *Radiological Audit of Remedial Action Activities at the Gunnison, Colorado, Site, 13-16 June 1994, Report GUN-A04*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.18.5.

- DOE (U.S. Department of Energy), 1994b. *Radiological Audit of Remedial Action Activities at the Gunnison, Colorado, Site, 19-22 September 1994, Report GUN-A05*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.18.5.
- DOE (U.S. Department of Energy), 1994c. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 27-28 June 1994, Report QS94127*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1994d. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 31 October to 1 November 1994, Report QS94139*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1993a. *Radiological Audit of Remedial Action Activities at the Gunnison, Colorado, Site, 28 Jun to 1 July 1993, Report GUN-S02*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.18.5.
- DOE (U.S. Department of Energy), 1993b. *Radiological Audit of Remedial Action Activities at the Gunnison, Colorado, Site, 4-7 October 1993, Report GUN-A03*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.18.5.
- DOE (U.S. Department of Energy), 1993c. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 7-9 July 1993, Report QS93036*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1993d. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 29 October 1993, Report QS93056*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1992a. *Radiological Audit of Remedial Action Activities at the Gunnison, Colorado, Site, 16-19 September 1992, Report GUN-S01*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.18.5.

- DOE (U.S. Department of Energy), 1992b. *Report of Quality Assurance Surveillance of the MK-Ferguson Company Remedial Action Activities at the Gunnison, Colorado, Site, 24-25 September 1992, Report S211*, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, UPDCC File Location No. 8.29.3.2
- DOE (U.S. Department of Energy), 1992c. *Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site at Gunnison, Colorado*, DOE/AL-050508.0000, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, October 1992.
- DOE (U.S. Department of Energy), 1988. *UMTRA Project Audit/Surveillance Program Plan*, UMTRA-DOE/AL-400326.0000, prepared for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico.
- MK-F (Morrison Knudsen-Ferguson), 1996. *Gunnison, Colorado Draft Completion Report*, January 1996 (5 Vols) (Site Completion Reports).
- MK-F (Morrison Knudsen-Ferguson), 1994. *UMTRA Project, Gunnison, Colorado, Remedial Action Inspection Plan*, November 10, 1994 UPDCC File Location No. 8.13.4.2.
- NRC (U.S. Nuclear Regulatory Commission), 1993. *On-Site Construction Review of Remedial Action Construction Activities at the Gunnison, Colorado, Site, 1 September 1993, report NRC-01*, prepared for the U.S. Department of Energy, by the U.S. Nuclear Regulatory Commission, UPDCC File Location No. 9.13.4.2.7.
- Scoutaris, M., 1996. U.S. Department of Energy, personal communication with S. Arp, U.S. Department of Energy and P. Pehrson, Jacobs Engineering Group Inc., UPDCC File Location No. 8.13.2.3.
- Ulland, L., 1994a. Jacobs Engineering Group Inc., personal communication with R. Cornish, U.S. Department of Energy, UPDCC File Location No. 8.18.5, Albuquerque, New Mexico, 7 January 1994.
- Ulland, L., 1994b. Jacobs Engineering Group Inc., personal communication with R. Cornish, U.S. Department of Energy, UPDCC File Location No. 8.18.5, Albuquerque, New Mexico, 11 April 1994.

#### CODE OF FEDERAL REGULATIONS

40 CFR Part 61, *National Emission Standards for Hazardous Air Pollutants*, U.S. Environmental Protection Agency.

40 CFR Part 192, *Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings*, U.S. Environmental Protection Agency.

**FEDERAL REGISTER**

60 FR 2854, *Groundwater Standards for Remedial Actions at Inactive Uranium Processing Sites*, final rule, U.S. Environmental Protection Agency, 11 January 1995.

**UNITED STATES CODE**

42 USC §7901 *et seq.*, *Uranium Mill Tailings Radiation Control Act*, 8 November 1978.